

Listing of Claims:

This Listing of Claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An engineered osteochondral graft for promoting the growth of cartilage in a patient at a defect site in need of repair, comprising a ~~matrix~~ polymer block and a first population of ~~MSCs~~ mesenchymal stem cells, wherein said first population of ~~MSCs~~ mesenchymal stem cells are press-coated on a ~~top~~ surface of said ~~matrix~~ polymer block, and said first population of ~~MSCs~~ mesenchymal stem cells forms a cartilage layer on said ~~top~~ surface of said ~~matrix~~ polymer block.

2. (Currently Amended) The engineered osteochondral graft of claim 1, wherein said ~~matrix~~ polymer is biodegradable.

3. (Currently Amended) The engineered osteochondral graft of claim 2, wherein said ~~matrix~~ polymer is selected from the group consisting of demineralized bone matrix (~~DBM~~), biodegradable polymers, calcium-phosphates and hydroxyapatite.

4. (Currently Amended) The engineered osteochondral graft of claim 3, wherein said ~~matrix~~ polymer is a porous polylactic acid.

5. (Currently Amended) The engineered osteochondral graft of claim 4, wherein said porous polylactic acid is D,D-L,L-polylactic acid.

6. (Currently Amended) The engineered osteochondral graft of claim 5, wherein said ~~matrix~~ polymer block is a D,D-L,L-polylactic acid polymer block of about 1x0.5x0.5 cm, said ~~top~~ surface of said ~~matrix~~ polymer block is about 0.25 cm², said first population of ~~MSCs~~ mesenchymal stem cells is about 1.5x10⁶, and said cartilage layer is about 1-1.5 mm thick.

7. (Currently Amended) The engineered osteochondral graft of claim 1, wherein said ~~matrix~~ polymer block has a shape compatible with said defect site.

8. (Currently Amended) The engineered osteochondral grafted of claim 1, wherein said ~~MSCs~~ mesenchymal stem cells are isolated from a tissue selected from the group consisting of bone marrow, blood, periosteum, muscle, fat, bone and dermis.

9. (Currently Amended) The engineered osteochondral grafted of claim 8, wherein said ~~MSCs~~ mesenchymal stem cells are isolated from bone marrow.

10. (Currently Amended) The engineered osteochondral graft of claim 1, wherein said engineered osteochondral graft further comprises an osteoinductive growth factor in an amount sufficient enough to elicit osseointegration, wherein said osteoinductive growth factor is BMP-2.

11. Cancelled

12. (Currently Amended) The engineered osteochondral graft of claim 1, wherein said engineered osteochondral graft further comprises a second population of ~~MSCs~~ mesenchymal stem cells which are loaded ~~in the remaining volume of said matrix~~ within a porous scaffold of said polymer block, and said second population of ~~MSCs~~ mesenchymal stem cells is in an amount sufficient enough to elicit osseointegration.

13. (Previously Presented) The engineered osteochondral graft of claim ~~12~~ 1, wherein said engineered osteochondral graft further comprises an osteoinductive growth factor in an amount sufficient to elicit osseointegration, wherein said osteoinductive growth factor is BMP-2.

14. (Previously Presented) The engineered osteochondral graft of claim 13, wherein said osteoinductive growth factor is BMP-2.

15-16. Cancelled.

17. (Currently Amended) A method of fabricating an osteochondral graft comprising the steps of contacting a ~~top~~-surface of a ~~matrix~~ polymer block with a high-density pellet of a population of ~~MSCs~~ mesenchymal stem cells for a first period of time sufficient enough to form a ~~cell-matrix~~ cell-polymer structure, and culturing said ~~cell-matrix~~ cell-polymer structure in a chondrogenic differentiation medium for a second period of time sufficient enough to form a cartilage layer on said ~~top~~-surface of said ~~matrix~~ polymer block, wherein said population of ~~MSCs~~ mesenchymal stem cells is an amount enough for the formation of said cartilage layer.

18-20. Cancelled.

21. (Currently Amended) The method of claim 17, wherein said first population of ~~MSCs~~ mesenchymal stem cells is about 1.5×10^6 cells per 0.25 cm^2 of said top surface area.

22. (Currently Amended) The method of claim 17, wherein said ~~matrix~~ polymer block is a D,D-L,L-polylactic acid polymer block of about $1 \times 0.5 \times 0.5 \text{ cm}$, said ~~top~~-surface is about 0.25 cm^2 , said population of ~~MSCs~~ mesenchymal stem cells is about 1.5×10^6 , said first period of time is about 3 hours, said second period of time is about 3 weeks, and said chondrogenic differentiation medium contains about 10 ng/ml TGF- β 1.

23-28. Cancelled.